



## Low Level Light Therapy Course (Photorejuvenation)



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FITNESS, SAFETY & MEDICAL SUPPLIES

# Photorejuvenation Course Book

## Instructor's Edition

This is the same course book given to students. Questions from tests are in the particular sections in **red and are only in the Instructor's edition.**

## Chapters

1. **Definitions, Basic History of Light Therapy and Knowledge of Electromagnetic Spectrum**
2. **LED, IPL, and Laser Treatments**
3. **Cosmetic Light Therapy**
4. **Safety Considerations**
5. **Serums and Products Used With Light Therapy**
6. **Combining Treatments**
7. **Treatment Methods and Protocols**

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# Chapter 1

1) **Visible Light:** light that is within the visible spectrum, 400nm (violet) to 700nm (red)

1. Visible light is light that humans can see and is between 400 and 700 nm wavelength.

True

False

2) **Infrared Light:** light in the invisible spectrum below red, from 700nm to 2,000nm

2. Infrared light is between 700 and 2000 nm wavelength and we can see it.

True

False

3) **Frequency:** number of cycles per second measured in Hertz (Hz).

3. Frequency is measured in Hertz (Hz).

True

False

4) **Coherency:** wavelengths of light traveling in phase with one another.

4. Coherency is when wavelengths of light are traveling in phase with each other. Lasers can produce this type of light.

True

False

5) **Monochromatic:** light that is of one color, or one wavelength.

5. Monochromatic is when there are multiple wavelengths of light.

True

False

6) **Collimation:** light focused in a beam, maintaining a constant diameter regardless of its distance from the object or surface directed toward

7) **Nanometer (nm):** a unit of measure of wavelength of light (one billionth of a meter)

6. Nanometer is a unit of measure that is used to measure the wavelengths of light and is one billionth of a meter.

True

False

8) **Nanosecond:** one billionth of a second

7. Nanosecond is 100 seconds.

True

False

9) **Joule (J):** unit used to measure the energy delivered

8. Joules are used to measure energy delivered.

True

False

10) **Watts (w)** and milliwatts (mw, 1/ 1000th of a watt): units used to measure the power capability

9. Watts and milliwatts are used to measure power.

True

False

11) **Peak power: output:** the maximum output of power, measured in milliwatts and watts

12) **Average power:** amount of power actually delivered in a given period of time

13) **Duty cycle:** the amount of time the light is actually on during a given period of time

14) **LED-(Light Emitting Diode)-** a solid state device that emits a narrow bandwidth of light. A 660 nm LED will produce 94% of its light energy in between 658 and 662 nm.

10. LED stands for Light Emitting Diode.

True

False

15) **Laser-(Light Amplification by Stimulated Emission of Radiation)** A device that produces a single wavelength of light energy that is coherent. A 632.8 nm laser will produce 100% of its light energy in the 632.8 wavelength range.

11. A LASER is a device that produces a single coherent wavelength of light.

True

False

16) **IPL-(Intense Pulse Light)** High power light therapy devices that use an intense flash bulb to produce a wide spectrum of light wavelengths and filters to reject everything above a certain wavelength and below another wavelength to let a bandwidth of light pass for biostimulation.

12. IPL stands for Intense Pulse Light

True

False

13 Cosmetic IPL devices use LEDs for their light source.

True

False

## Introduction and History

Light Therapy has been in use for over 100 years. In 1903, Niels Finson was awarded the Nobel Prize for his work on UV rays and various skin conditions which showed a success rate of 98% in thousands of cases, mostly lupus, a autoimmune disease of skin and connective tissue. Before the invention of antibiotics, in the 1930s and 1940s, blood irradiation with light was used by American Doctors Emmett Knott and George Miley to treat a multitude of maladies with great success. In 445 cases of acute infections, early diagnoses showed a 100% recovery rate; moderately advanced cases showed a 98% recovery rate and even in apparently moribund cases showed a 45% recovery rate.

With the invention of antibiotics and the hope that all diseases could be cured with modern chemistry, American interest in light therapy subsided, but interest renewed in eastern countries in the 1960s through 1990s. In 1967, Hungarian scientist Endre Mester began work with LASERs to see if they would cause cancer. He found not only that they did not cause cancer, but they actually aided in the healing of wounds. From the 1980s to present, Russian scientists continued the work of Knott and Miley and have made progress towards the explanation of the root chemical causation of helpful benefits of light therapy and actually introducing light therapy as a normal part of Russian medical practice.

In the 1990s, NASA (National Aeronautic and Space Administration) began doing light therapy research as a part of long term space flight crew health maintenance. Their findings supported Russian research on the light therapy and renewed interest in light therapy in the United States. Because of technical complications in using lasers and also due to inherent dangers, research moved to the use of low level light therapy using single wavelength light emitting diodes in place of lasers. Sometimes called “cold lasers”, the advent of these devices allowed light therapy to move away from medical offices to Estheticians, Day Spas, and non medical skin care facilities.

Today, light therapy has been shown in independent research worldwide to deliver powerful therapeutic benefits to living tissues and organisms. Clinically, there have been no recorded side effects in over 1,700 publications.

Both visible red and infrared light have been shown to promote at least 24 different positive changes at the cellular level. Light radiation must be absorbed to produce a biological response. All biological systems have a unique absorption spectrum which determines which wavelengths of radiation will be absorbed to produce a given therapeutic effect. The visible red and infrared portions of the spectrum have been shown to be highly absorbent and produce unique therapeutic effects in living tissues.

16. Clinically, using low power light therapy, there have been no recorded side effects in over 1700 publications.

True  
False

17. Both visible red and infrared wavelengths have been shown to produce at least 24 positive changes at the cellular level.

True  
False

40 Light Therapy has been in use for over 100 years.

True  
False

## The Electromagnetic Spectrum and Light Therapy

The Electromagnetic Spectrum is composed of various energy waveforms that can be considered particles (Photons). Electromagnetic radiation is emitted by the Sun, Light Bulbs, Fires or Heated Objects, Radio Transmitters, Microwave Ovens, Lasers, LEDs (Light Emitting Diodes), etc. There are two theories of what electromagnetic radiation consists of, Wave Theory and Particle Theory. For this course we will only refer to the wave theory of light and use the words “light energy” when the usage of Photons is indicated. We do this in order to avoid confusion when the scientific data sometimes goes from one theory to the other or when one particular theory suits observed phenomena best.

Electromagnetic radiation consists of many different wavelengths that are used for different applications. The term “wavelength” refers to the length of a sinusoidal wave from one point to the point where the wave begins to repeat itself. This length is measured in meters. They range from very short wavelengths such as Gamma Rays (1 to 1000 fm to very long radio waves at 1 to 1000 meters. Below is a description of the various waves and their usage.

NAME	WAVELENGTH	USED FOR
Radio Waves	1-1000 meters	Radio, TV
Micro Waves	2-1000mm (1mm=.001meter)	Radar, Ovens
Infrared Waves	700-2000nm (1nm=.000000001 meter)	Heating lamps
Visible Light	400-700nm	Illumination
Ultra Violet (UV)	1-400nm	Tanning lamps

X-rays	1-1000pm (1pm=.000000000001 meter)	X-raying
Gamma Rays	1-1000fm (1fm=.000000000000001 meter)	accelerators

15. A tanning bed might use 375nm wavelength light for tanning purposes.

True

False

## In the Visible Light, Nanometers (wavelength) = Color

The visible light spectrum is the wavelengths or colors that humans can see. They start at 400nm (Blue) and end around 700nm (Red). In light therapy, you will see various wavelengths mentioned. The wavelengths are different shades of color or they may not be able to be seen at all. 420nm light is a deep blue color. 480nm light is a lighter shade of blue. 630nm is a light shade of red. 680nm is a dark shade of red. 350nm (UV) is not visible to the eye. 950nm (Infrared) is not visible to the eye. You will notice in our equipment when the equipment is energized, some LEDs (light emitting diodes) will appear not to be shining. These are two Infrared Wavelengths. They are shining; you just can't see the light. Digital cameras can detect this light if they do not have an IR or "hot filter" coating on the lens. This is the reason that when you see a picture of our device (energized), they all appear on.

## Scientific Research

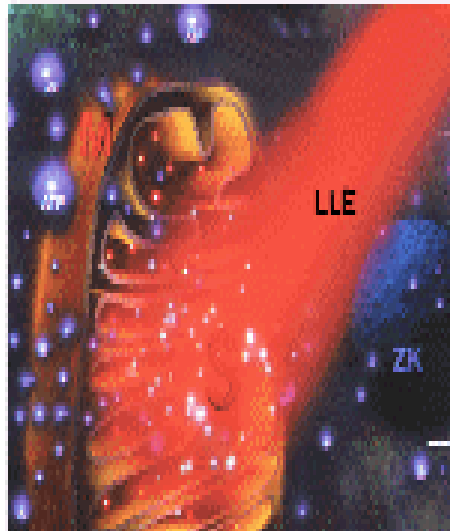
One of the most impressive scientists in this field is Tina Karu. She is head of the Laser Biology and Medicine Institute at Troitsk, Russia. She has published almost 100 papers on light therapy. She suggests that irradiation of isolated mitochondria induces changes in cellular homeostasis, which entails a cascade of reactions. It is proposed that a number of the components of the respiratory chain (e.g., cytochromes, cytochrome oxidase and flavine dehydrogenase), are primary photoacceptors or chromophores and thus able to absorb light at appropriate wavelengths. This causes short-term activation of the respiratory chain, leading to changes in redox status of both mitochondria and cytoplasm. In turn, the activation of the electron transport chain results in enhanced synthesis of ATP. Furthermore, laser irradiation also affects hydrogen ion levels in the cell. This, coupled with an increase in ATP, causes activation of other membrane ion carriers such as sodium and potassium, and alters the flow of calcium between mitochondria and cytoplasm. The variation of such parameters is a necessary component in the control of proliferative activity of the cell.

18. Tiina Karu is a leading scientist in the field of Low Power Light Therapy.

True

False

Generally speaking, Photorejuvenation essentially works at the cellular level. Each cell contains a number of power plants, called mitochondria. The function of these power plants is to produce ATP, the form of energy that can be used by the cell to function properly.



LED (Light Emitting Diodes) light is narrow bandwidth light as opposed to incandescent or florescent (wide bandwidth) light. LEDs from the red and infrared spectrum of the electromagnetic radiation are used for Photo Rejuvenation because they are well absorbed by their collector surfaces of the mitochondria as an additional source of energy. The cellular power plants can thus produce more ATP. ATP is the cellular energy or fuel the skin cells strive after and need. A sufficiently high supply of cellular energy enables our skin cell to work under optimum conditions and is the essential prerequisite to ensure a successful self-healing process.



## Physiological Benefits

In mature skin and tissue, the increased cellular activity results in physiological benefits which taken together are frequently called, "Photorejuvenation". These benefits are:

1. Increased blood circulation;
2. Increased proliferation of fibroblasts;
3. Stimulation of collagen production;
4. Increased lymphatic activity;
5. Stimulation of the body's anti-inflammatory response.

These effects are discussed in detail in Chapter 3.

## Wavelength and Depth of Penetration

There is a relationship with wavelength and how quickly the energy is absorbed. Normally, the shorter the wavelength the quicker it is absorbed. Longer wavelengths therefore penetrate further into the tissues. The very short wavelength Ultra Violet (UV) is absorbed almost completely within the first 1 to 2 mm of skin depth. Depth of penetration is defined as the depth at which 60% of the light is absorbed by the tissue, while 40% of the light will continue to be absorbed in a manner that is less fully understood. This 60% distance is where the light will have the greatest bio-stimulation effect.

The diverse tissue and cell types in the body all have their own unique light absorption characteristics; that is, they will only absorb light at specific wavelengths and not at others. For example, skin layers, because of their high blood and water content, absorb red light very readily, while calcium and phosphorus absorb light of a different wavelength. Although both red and infrared wavelengths penetrate to different depths and affect tissues differently, their therapeutic effects are similar.

Visible red light, at a wavelength of 660 nanometers, penetrates tissue to a depth of about 8-10 mm. It is very beneficial in treating problems close to the surface such as wounds, cuts, scars, trigger and acupuncture points and is particularly effective in treating infections. Infrared light (904nm) penetrates to a depth of about 30-40 mm which makes it more effective in the treatment of joints, deep muscle, etc. It must not be thought that Infrared light penetrates to 30-40 mm and then starts to have an effect. It is much as a streetlamp on a foggy night. The light is brightest next to the lamp itself and slowly fades as it penetrates the fog. The greatest biostimulation effect will be closest to light source.

19. Infrared light penetrates the body easier (deeper) than red light.

True

False

20. Blue light penetrates the body more easily (deeper) than red light.

True

False

# Chapter 2: LED, IPL, and Laser Treatments

## What is the Difference between LED's, IPL, and LASERS?

LED's and LASERS both produce electromagnetic radiation at specific wavelengths. IPL devices normally produce a wider bandwidth (multiple wavelengths) than pure Lasers or LED's. A laser will produce 100% of its light energy in a single wavelength such as 632.8 nm and the light will be coherent (single wavelength in phase). A LED producing light at 632nm will produce 94% of the light between 630nm and 634nm and the light is not coherent. An IPL device will produce a bandwidth of high intensity light energy where 100% might lie between 580nm to 900nm. IPL devices can use several filters to vary the bandwidth. Several studies establish that it is the light itself at specific wavelengths which is therapeutic in nature and not the machine producing it.

21. An IPL device is usually a laser and produces coherent light.

True

False

## High Power versus Low Power

Light Facial Devices can be split into two groups for cosmetic applications; High Power (lasers and IPL) and Low Power (LEDs). These treatments have similarities and differences. Both treatments give the rejuvenation effects such as increased RNA/DNA synthesis and increased ATP production. The high power devices are a much better treatment for vascular conditions such as Telangiectasis, Varicose Veins and Spider Veins.

The high power treatments use enough power to cauterize the vessels and they will be reabsorbed into the body. The Low Power devices do not have this type of power. Age Spots are melanocytes that have expanded beyond their normal size and acquire extra pigments. Low power treatments have the very positive effect of making some, but not all, shrink back to their original size.

High power treatments use enough power to kill the melanocyte and it will float to the surface in 5 to 12 days and peel off like a scab during the normal skin renewal process. The chart on next page shows some of the differences between cosmetic treatments.

32. High Power Light Treatments (Laser and IPL) are a better for vascular problems than Low Power Treatments.

True

False

33. Low Power treatments (LED) can use enough power to kill melanocytes (age spots) and they will float to the surface in 5 to 12 days and peel off.

True

False

High/Low Power Treatment Table

<i>Conditions</i>	<i>High Power</i>	<i>Low Power</i>
Rejuvenation Effects	Yes	Yes
Cost of Equipment	High	Low
Insurance Costs	High	Low
Vascular Treatments	Yes	No
Risk of Tissue Damage	Yes	No
Risk of Eye Damage	Yes	No
Medical Supervision	Yes	No
Painful	Yes	No
Downtime	Yes	No
Anti-Aging	Yes	Yes
Acne	Yes	Yes

34. High Power light treatments are somewhat painful.

True

False

35. Both High and Low Power light treatments give the rejuvenation effects.

True

False

# Chapter 3 - Cosmetic Light Therapy

## What Does Red/Infrared Light Therapy Actually Do?

**Increase vascularity** (circulation). By increasing the formation of new capillaries, additional blood vessels replace damaged ones. New capillaries speed up the healing process by supplying additional oxygen and nutrients needed for healing. In addition, light therapy increases vasodilation which also improves blood flow to the skin and uptake of products used on the skin. The initial cosmetic effects typically seen with most clients are a result of this increased blood flow to the skin and not increased collagen which takes longer to produce. The benefit of this temporary improvement in the appearance of the skin is to allow clients to see improvement and gain confidence in the treatment while the longer term benefits such as collagen production take place.

22. Low level light therapy has been shown to decrease blood circulation.

True

False

**Stimulate the production of collagen.** Collagen is the most common protein found in the body. Collagen is the essential protein used to repair and replace damaged tissue. It is the substance that holds cells together with a high degree of elasticity. Tissue without collagen is stringy and lacks substance. For this reason, as people age their tissues, muscle and skin, tend to lack firmness and look less full. By increasing collagen, we improve the appearance of skin, making it look younger, smoother, more firm, supple, and healthier.

The human body gradually loses its ability to replace collagen as we age. By the 60's, the body may produce little or no collagen. The red/infrared treatment will stimulate collagen production but takes the body weeks and months to produce collagen. One does not see this effect on the first or second treatment. Once it has been produced, however, the effects will be longer lasting thereby extending the time between maintenance treatments.

23. Low level light treatments have been shown to increase collagen production.

True

False

**Stimulate the release of adenosine triphosphate** (ATP). ATP is the major carrier of energy to all cells. Increases in ATP allow cells to readily accept nutrients and expel waste products faster by increasing the energy level in the cell. Food is converted into ATP before it is utilized by the cells. ATP provides the chemical energy that drives the chemical reaction of the cell. By increasing ATP, we increase the activity level of the cells. In turn, this appears to stimulate the other effects such as increased circulation.

24. ATP stands for adenosine triphosphate.

True

False

25 ATP provides the chemical energy that drives the chemical reactions of the cell.

True

False

**Increase lymphatic system activity.** Edema, which is the swelling or natural splinting process of the body, has two basic components. The first is a liquid part which can be evacuated by the blood system and the second is comprised of the proteins which have to be evacuated by the lymphatic system. Research has shown that the lymph vessel diameter and the flow of the lymph system can be doubled with the use of light therapy. The venous diameter and the arterial diameters can also be increased. This means that both parts of edema (liquid and protein) can be evacuated at a much faster rate to relieve swelling. Try treating swelling under the eyes, in most cases you can reduce it dramatically.

26. Low level light treatments have no effect on the lymphatic system.

True

False

**Increase RNA and DNA synthesis.** This helps the body replace damaged cells more promptly.

27. Low level light treatments increase RNA/DNA synthesis.

True

False

**Reduce the excitability of nerve tissue.** The photons of light energy enter the body as negative ions. This requires the body to send positive ions, calcium among others, to flow to the area being treated. These ions assist in regulating the nerves, thereby relieving pain. While this benefit may not be used in cosmetic applications, you may choose to offer pain relief as part of relaxing stiff muscles and massage.

28. Low level light treatments reduce the excitability of nerve tissue.

True

False

**Stimulate fibroblastic activity which aids in the repair process.** Fibroblasts are present in connective tissue and are capable of forming collagen fibers.

29. Fibroblast cells are stimulated by low level light treatments.

True

False

**Increase phagocytosis.** This is the process of scavenging for and ingesting dead or degenerated cells by the phagocyte cells. This is an important part of the infection control process. The healing process depends upon the destruction of infection and cellular clean up. This process is particularly important in acne treatment.

30. Low level light treatments aid the process of scavenging and ingesting dead or degenerated cells.

True

False

**Induce a thermal like effect in the tissue.** The light raises the temperature of the cells although there is no heat produced from the diodes themselves. In some clients this effect may be visible as a blush, sometimes called the photo rejuvenation glow.

**Stimulate tissue granulation and connective tissue projections.** These are part of the healing process of wounds, ulcers or inflamed tissue. When using the red/infrared post surgically or on wounds, you will find the healing process accelerated. Generally, clients experience less scarring.

31. The only cosmetic effect from low power light treatment is that it builds collagen.

True

False

## Anti-Aging (Red/Infrared Treatment with Quasar SP):

Photo rejuvenation has numerous client benefits for anti-aging treatment.

- Reduces fine lines and wrinkles;
- Builds collagen;
- Increased circulation;
- Increases moisture retention;
- Increases oxygenation and restoration of skin's natural cellular activity, which keeps skin renewed and fresh;
- Increases lymphatic system drainage which detoxifies the skin tissue;
- Softens scarring and rough texture;
- Smooths out uneven pigmentation for more consistent coloration;
- Thickens and firms skin;
- Reduces pores;
- Promotes a healthy look – Increased radiance;

## Acne and other Skin Conditions (Red/Infrared Treatment with Quasar SP):

Photorejuvenation provides a superior treatment for acne. The body's physiological response to light stimulation acts quickly on the root causes of acne.

- Anti-inflammatory action reduces blemishes and stimulates healing;
- The Light Therapy normalizes sebum production to help control acne breakouts;
- With the Quasar Blue – the combined red/infrared and blue light therapy kills or reduces P.acne bacteria.

## Additional Important Information about the Cosmetic Treatment

Photo rejuvenation effects last for 30 to 90 days once maximum results are achieved. A 30-minute maintenance treatment is all that is needed following the initial series of treatments. The exact amount of time between maintenance treatments depends on the quality of skin. Also keep in mind that some of the effects will last for months, such as the collagen buildup.

Photo rejuvenation has no reported side effects. This does not mean, however, that it can be used indiscriminately with other products that may themselves cause side effects. You must make certain that products you are using on your clients are safe and non-allergic. Many skin care specialists with experience in photo rejuvenation believe that the application of light actually makes other products more effective. Studies show that photo rejuvenation increases the uptake and penetration of products.

Photo rejuvenation is pain free. This is an attractive bonus in attracting clients who fear microdermabrasion, collagen injections, Botox, or laser resurfacing due to pain. Some clients may experience brief warmth or “glow” following treatment.

Photo rejuvenation has no downtime. You clients can put their make-up on immediately after treatments. They can go in the sun and in water. You may also reduce downtime in clients undergoing ablative types of treatment.

Photo rejuvenation has a broad range of application. You can treat Acneic clients on Accutane or Retin-A, as well as treat other skin conditions not manageable with microdermabrasion or chemical peels.



Combination of treatments. You may combine photo rejuvenation with microdermabrasion, peels, products, etc. It will only enhance the benefits of these other treatments and reduce downtime.

The cost of treatments. The spa photo rejuvenation treatment can equal the benefits of similar treatments using laser IPL but at less than ½ the cost.

## What Low Level Light Therapy Won't Do

Low level light therapy works well on conditions which respond to a stimulation of the healing response. There are other skin conditions, however, which do not respond to healing and must be, therefore, treated by other methods. Generally speaking, any skin condition that is genetic in origin will not respond to treatment. This includes port wine stains, freckles, moles, and spider veins.

Some of these conditions do respond to heat based laser therapy and must be treated by physicians or other licensed medical professionals.

Light therapy also will not lift tummies, breasts, or faces. The client will need to see a plastic surgeon for treatment of this type.

Low level light therapy may be used on any skin type and will not harm dark skin nor will it remove a tan.

# Chapter 4 - Safety

LED light therapy is considered a safe treatment without harmful side effects. As with any treatment, however, client safety must always be of first concern.

## Side Effects

At this time, research has shown no side effects from this form of therapy. Red and Infrared wavelengths are present in sunlight. The reason we do not use sunlight for this type of therapy is that the sun generates the entire electromagnetic spectrum, which includes X-rays, Gamma Rays, UV and other wavelengths that have been documented to harm tissues.

14. The sun only produces the visible portion of the electromagnetic spectrum.

True

False

## Risk of Eye Injury

The Food and Drug Administration (FDA) has divided lasers and radiation producing devices into categories (Classes 1 through 4) according to their potential to damage the eye. Classes 1 through 3A (laser pointers are 3A devices) are considered safe. Class 3B involves a certain risk. Class 4 is a definite risk. This rating has nothing to do with the quality, medical use, or efficiency of these types of devices. It only refers solely to the possibility of eye damage. The Quasar and similar LED based devices are Class 2 devices. It is not wise to look directly into any bright light source. You may use goggles on the client with our machine when treatment is being administered. It is protection enough, however, just to have the client close their eyes. For example, when removing a sty from the eyelid, even though using a powerful laser and the sty is over the pupil, the protocol is to just have the subject close their eyes. When the light hits the eyelid it is dispersed over the entire retina which reduces the power by about a million times.

## Machine Safety

Examine the electrical cord between the power supply and Quasar hand piece for nicks or shorts before every treatment. Call the home office for a replacement power supply if cord is damaged. Keep the unit away from small children.

37. You should inspect the Quasar's electrical cord for nicks and damage periodically.

True

False

38. You should allow small children to play with the Quasar.

True

False

## Contra Indicators

Contra indicators are conditions in which medical supervision is needed before administering treatment. Light Therapy is a very new technology and the interactions between the light and certain drugs and maladies have not been fully studied. Under these conditions, a medical Doctor's permission and supervision is needed before giving treatments to clients. Contra Indicators are:

EPILEPSY,  
PREGNANCY,  
CORTISONE, AND STEROID INJECTIONS AND  
CANCER FIGHTING DRUGS.

IODINE is not a contra indicator but this drug does enhance photosensitivity and the likelihood of redness after a treatment. This redness will leave in 2 to 6 hours. The client should be informed about this before treatment. There is a client consent form included with the paperwork that is shipped with machine. We suggest you have the client sign the form. The file from which the form was made is on the Light Pulse Technology CD included with the machine so that you can reproduce them.

36. A client that is taking cancer fighting drugs should get their doctor's permission before undergoing these types of treatments.

True

False

39. It is recommended that a "client consent form" be signed before giving treatment.

True

False

## Chapter 5 – Serums and Products

In March of 2003, the American Dermatological Society suggested that the use of anti-oxidant vitamin serums with photo rejuvenation gave better cosmetic effects than using either alone. This observation has lead to the use of many types of serums in conjunction with photo rejuvenation. Photo rejuvenation is a new technology and exact protocols for using different types of serums are still being established. We will give you some general guidelines to use these products with photo rejuvenation. Contacting the manufacturer's representative of the particular products is always recommended.

I

14. The use of high quality antioxidant creams and serums has been shown to enhance the cosmetic effects of the light facial treatment.

True

False

### Cleansers

Vitamin, Glycolic Acid, Salicylic Acid and other cleansers should be used before treatment to remove makeup and skin debris. You should apply cleansers using manufacturer's instructions. If you are using a ultra sound skin scrubber, you may use the cleanser as a ultra sonic transfer compound by applying the cleanser liberally on the skin and removing cleaner with the scrubber.

18. You cannot use a Skin Cleanser as an ultra sound transfer compound.

True

False

### Peptides

Penta-peptide and Copper-peptide would be used after cleaning the skin and before the treatment.

17. You would apply copper peptides type serum before a treatment.

True

False

### Anti-oxidants

Anti-oxidants, vitamins A, E, C, K and Alpha-Lipoic Acid, should be used after cleaning the skin and either before or after the treatment. You should apply using manufacturer's instructions.

Note: There are respected Estheticians on both sides on whether to use Anti-oxidants either pre or post photo rejuvenation treatment. We believe that post treatment is slightly better but either way is acceptable.

19. Anti-Oxidants are the only serum that could be used either before or after photo rejuvenation treatment.

True

False

## Moisturizers

Moisturizers such as Hyaluronic Acid, Ellagic Acid, and Aloe should be used after cleaning the face and before photo rejuvenation treatment. You should apply using manufacturer's instructions.

## Peels

Skin peeling agents such as Glycolic Acid and Salicylic Acid should be used after cleaning and before photo rejuvenation treatment.

Note: Always neutralize chemical before applying photo rejuvenation treatment. The light emitted by this equipment can enhance the reactivity or effect of these chemicals by a factor of 2 to 3.

20. You always neutralize a peel before applying a photo rejuvenation treatment.

True

False

## Sun Blocks

Sun Blocks such as Titanium Oxide, Zinc Oxide, and PABA should be used after photo rejuvenation treatment.

## Chapter 6 - Combining Treatments

Many Cosmetologists and Estheticians currently use Light Therapy in combination with other treatment modalities. The most common combinations are probably with microdermabrasion and peels. Treatments such as these, work partly by damaging the epidermis which stimulates the body to begin healing the skin. The new skin typically looks younger and fresher. The downside to this type of treatment is that over time scar tissue can build up which in turn defeats the benefits of ablative techniques.

The Light Therapy works from the inside out by stimulating the body's healing response. When ablative techniques are performed, this additional stimulus of Light Therapy to the healing can dramatically calm the skin and improve healing time. In turn, this reduces down time.

### Combining with Ablative Techniques

When combining Light Therapy with ablative techniques, you may perform the treatment immediately after the ablative treatment or elect to alternate the complimentary treatments every 5 to 7 days apart. The benefit to performing the Light Therapy immediately after the ablative treatment is the calming effect on irritated skin which can reduce downtime. Do not underestimate the benefit of this simple follow-up procedure. The client will look and feel better.

If using peels, be certain to remove the entire product from the skin before using Light Therapy. If such product is left on the skin while performing Light Therapy treatment, it can result in heightened irritation. If that does occur, clean the face immediately to remove the product and reapply the light treatment to calm the skin.

### Combining with Products

Because Light Therapy improves healing times, increases blood flow, circulation, and lymphatic drainage, it also benefits use of products which must penetrate the skin. These products are typically applied just prior to, during, or just after treatment. For example, if doing a two pass treatment with the light, you may apply a skin lightener between passes with the light and then after the treatment follow up with a moisturizer.

## Chapter 7 – Treatment Methods and Protocols

**The Skin Analysis:** All photorejuvenation treatments must begin with a complete and thorough analysis of the skin on which you plan to work. Face, neck, decollate, hands, arms, chest, etc. can all be included. You must identify skin problems, discuss them with your client; determine which flaws he or she wishes to correct; and make your professional suggestions for treatment.

Your client may come to you with his or her mind already made up regarding what treatment they want. As a professional, however, you must identify all the flaws you will try to correct. This requires an evaluation of the skin. You must determine the etiology of the flaws with particular emphasis on distinguishing between those which have a genetic origin and those caused by environmental factors such as sunlight, smoking, chemical exposure, etc. Flaws with a genetic origin such as port wine marks, birthmarks, moles, freckles, and such cannot be changed by photorejuvenation. Other flaws such as photo age spots, lines, Rosacea, pore size, and the quality of the skin can be improved to some degree. Whether that degree of change is 90% or 50% can be determined only by evaluating the amount of skin damage and resilience of the skin.

If the client has extensively damaged skin, you should seriously consider combining photorejuvenation with exfoliation to remove the dead surface layer of skin. This approach will dramatically improve the results of both exfoliation and light therapy.

Having identified the flaws, you must discuss them with your client in the same manner a physician would discuss his/her impression with the patient. You must honestly and forthrightly indicate what flaws you believe are correctable and those that may remain refractory to treatment. You must then discern from the client, which flaws if any or all they wish to correct. Having reached agreement, you may then introduce photorejuvenation as an appropriate treatment. You must clearly tell the client what to expect, how long it will take and how much it will cost. Remember that you are the professional. You are giving your professional opinion to the client.

Go over the Informed Consent with the client with particular attention to contraindications, pregnancy, epilepsy, and steroid or cortisone use.

Finally, make certain that your client's expectations are within a reasonable range so that you don't build failure in at the start.

# Treatment Instructions for the Quasar SP

## Assembly

To assemble the Quasar SP, remove it from the carrying case, plug the power module into the power cord and simply plug the it into a 120 volt AC outlet.

## Operation

Through its economy of design and technological innovation, the Quasar SP brings professional level power and results in a portable, hand held, photorejuvenation device.

It has three modes of operation: Continuous Wave (CW, non pulsed), Low Pulse Frequency, and High Pulse Frequency.

When you push in the red button located at the back of the hand piece once an indicator light located on top of the hand piece will shine green indicating the CW mode of operation. In this mode, a tone will sound every four minutes to let you know to move to the next area.

Push in the red button again and the indicator light will shine orange indicating Low Frequency mode. A tone will sound every two minutes to let you know to move to the next area.





4. A red button at back of unit is used to sequence through Modes of operation on the Quantum Quasar.

True

False

Push in the red button again and the indicator light will shine red indicating High Frequency mode. A buzzer will sound every two minutes to let you know to move to the next area. Push in the button again and the indicator light will be off. The unit is in the off mode.

## Indicator Light Modes

-  Green Light = CW (continuous wave), 4 minute buzzer
-  Orange Light = Low Frequency, 2 minute buzzer
-  Red Light = High Frequency, 2 minute buzzer
-  No Light = Off



2. The Quasar SP has three modes of operation.

True

False

3. A green indicator light would show the Quasar in High Frequency Mode.

True

False

6. In the CW mode the buzzer sounds every 4 minutes.

True

False

7. In Low and High Frequency Mode the buzzer sounds every 2 minutes.

True

False

## Preparations

Explain about contra indicators: EPILEPSY, PREGNANCY, CORTISONE, or STEROID INJECTIONS and that IODINE increases photosensitivity.

Have the client sign the Client Consent to Treatment Form.

Remove all makeup and jewelry from the areas to be treated.

Clean areas to be treated with Witch Hazel Pad or other cleansing product. Be sure to use only non irritating products with Light Therapy. Place the safety goggles over the client's eyes. Alternatively, have your client close her eyes or place a scented oval gauze pads over the eyes.

10. It is important to clean face before low level light treatment.

True

False

1. You should clean areas to be treated with Witch Hazel or other cleansing product before treatment.

True

False

If treating the neck, cover the Thyroid Gland with a piece of 3 x 3 inch gauze. The Thyroid Gland is located at the base of the neck where the neck meets the chest, on the front and sides of the trachea. (NOTE: The wavelengths used in the Quasar light therapy have not been shown increase or decrease the activity of the Thyroid. The effects of light therapy on the thyroid are unknown. We would rather err on the side of Safety here.)

5. The only place on the body we cannot treat is around the Thyroid Area.

True

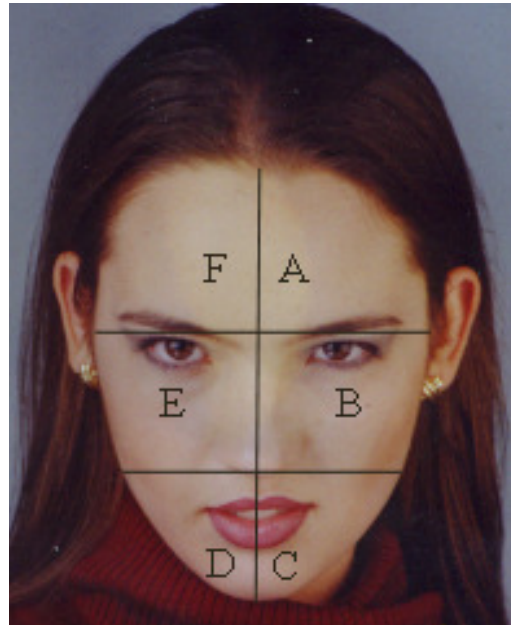
False

1. Divide the face into 6 sections as shown in the picture below.

9. In all facial treatment instructions we divide the face into 6 areas.

True

False



2. First, split the face into left and right halves and then into three horizontal areas. Areas C & D extend under the chin and under the jaw line. Areas B & E extend to the base of the ears.

3. Ask the client if they have any areas that they want to concentrate on. When you start using the concentrating cone, this will be an important point. (See Instruction 10)

8. You ask the client if there are any areas they would want you to concentrate on before the treatment.

True

False

4. Plug the wall mounted power supply into a 120 volt AC outlet. Push the red button at the back of the wand head twice. The machine should now be energized and the indicator light should be shining orange. This is low frequency mode.

5. Starting at section A, move the wand very slowly (about an inch every 8 seconds) over that area for two minutes. A soft tone will sound, signaling you to move to the next area. The wand head should contact the skin. It is not necessary to push down on the wand. The weight of the wand is pressure enough. If the client has extremely loose skin, slightly incline the leading edge of

the wand head up to keep the skin from bunching up in front of the wand. You may tighten the skin with your other hand if you prefer.

6. Next, move clockwise to section B. Slowly move the wand over that area for two minutes.

7. Moving in a clockwise direction, treat section C, then section D, section E, and last, section F.

8. Now push the button on the back of the hand piece until the indicator light shines red.

9. Treat all six areas (A-F) for two minutes each on the high frequency mode just as you did on low frequency mode.

10. Turn the unit off by pushing the red button at the back of the wand head until indicator light does not shine. Grasp Concentrating Cone and slide over glass retaining cap. Turn the unit on by pushing the red button until indicator light shines green and use the concentrating cone to treat difficult areas such as nose, nasal labia folds, around and between the eyes, and any other areas that the client wants extra attention on. Treat all these areas in a period of four minutes.

13. The Quasar's concentrating cone is used to treat difficult areas such as the nose and around the eyes.

True

False

11. Push the red button on the back of the wand until indicator light is not shining. You are now finished with the treatment. Total treatment should take twenty-eight minutes.

12. Clean the equipment by wiping the wand, goggles, and concentrating cone with alcohol. Remove the concentrating cone. (NOTE: When cleaning glass retaining cap and glass lens, lightly tighten the lens cap and glass back onto the wand tight enough so that the glass does not move around. **Do NOT Over Tighten.** In order to produce the maximum power from the light emitting diodes (LED), the glass must touch them. Damage may occur to the LEDs or circuit board if the glass lens and retaining cap are over tightened.)

11. You use pliers to retighten lens retaining ring after cleaning glass.

True

False

11. Unplug the power supply from the outlet and replace all of the equipment in carrying case.

## **Hyaluronic Serum Light Facial Treatment**

Use this treatment to super moisturize your skin. it is also a great treatment for weathered and dry skin.

Clean and prepare face as with normal treatment. Apply 1 pump squirt to fingers and massage into face. You may experience a slight stinging sensation that will disappear in a few minutes. Do not over apply. One to two pump squirts will normally cover the entire face. Precede with the normal facial treatment instructions

## **Skin Lightener Light Facial Treatment**

This is an excellent treatment to lighten age spots and uneven pigmentation. Clean and prepare face as with normal treatment and apply two to three drops on fingers and massage into face area then proceed with Continuous Wave Face Treatment.

When treating spots on arm and legs apply one or two drops and massage into skin. Treat area 4 minutes on CW mode per 5 square inch area. Stop treatments when desired lightening has occurred.

12. When using the Hyaluronic and K4-Pro Serums, you would apply serums before applying low level light treatment.

True  
False

**NOTE:** Do not mix K4 Pro and Hyaluronic Serum together for a combination treatment. Use one, or the other.

## **Other Treatment protocols**

### **Continuous Wave Facial Treatment**

This is a slightly more powerful treatment for clients that are slow responding or have reached a level of diminishing returns. Treat each of the 6 areas of the face for 1 beep (4 minutes) on CW (green) mode. Treat problem areas with Concentrating Cone for 4 minutes on CW mode.

## Using Two Quasar Units Simultaneously

This is a common practice among Cosmetologists and estheticians that wish to do combination treatments such as micro-derm and light treatment, or vitamin facial and light treatment. Some Estheticians use two units simply to save time.

The procedure is the same as using a single Quasar unit. As you start treatment on the right forehead with one unit, treat the left forehead with the other Quasar unit. Some Estheticians start at left forehead with one and right chin area with other to avoid probes colliding when doing the treatment. Continue this left and right application until the treatment is complete. This process reduces the time of completing a treatment of the six treatment areas from twenty-four minutes to twelve minutes. Use one wand and attach the concentrating cone to finish treating problem areas for four minutes. The whole treatment takes sixteen minutes.

When ordering a second unit, it is possible for us to disconnect the buzzer on the second unit so that you will not have two buzzers going off at the same time during a treatment. Please state your preference when placing your order.

16. It is not possible to use two Quasars in order to reduce time to do a treatment.

True

False

## The use of Antioxidants lotions with Treatment

The use of high quality Antioxidant creams and serums has been shown to enhance the cosmetic effects of Light Facial Treatments. Any high quality brand that includes one or all of the following is acceptable: Vitamin C Ester, Alpha Lipoic Acid, Vitamin E, Coenzyme Q10

There is some controversy on when to apply anti-oxidants during a treatment. Until lately, antioxidant creams were applied before treatment. Antidotal reports from estheticians to us about getting better results when applying creams after treatment led us to do some testing on the matter. Our conclusions are that you do get slightly better results by applying after a treatment but the treatment is slightly harder to apply, do to lack of a slip agent. In this case, you may wish to apply aloe gel as a slip agent and the cream or serum afterwards. Either before or after is an acceptable manner of application. To apply, just follow instructions for actual application of products.

14. The use of high quality antioxidant creams and serums has been shown to enhance the cosmetic effects of the light facial treatment.

True

False

## Acne Treatment

Inflammatory Acne results from an over production of sebum and an increase of the P. Acne bacteria which feeds on it. By adapting a combination red and blue treatment, you can effectively manage the causes of Acne without resorting to harsh medication. As in other cases, you may safely use the Light Therapy for Acne in combination with medication. The client does not have to stop other treatment modalities to do the Light Therapy.

Red/Infrared Light Therapy helps normalize the skin and appears to reduce the over production of sebum which is the major cause of Acne. You may perform the treatment using the high pulse mode or continuous wave mode anywhere from daily to weekly. Typically, one would expect to obtain positive results with days following the first treatment. Improvement will be seen continuously while the treatment progresses.

When combining the treatment, the Quasar Blue is use prior to the red. Apply the blue for five minutes to areas of inflammation. Apply the red/infrared in the same manner as a normal facial. (NOTE: if you are treating Acne and have to choose between using the red or the blue but not both, then choose the red. The sebum reduction and anti-inflammatory properties of red/infrared are much more effective than the blue light alone.)

### Care and Maintenance of Your Quasar

The Quasar has been built for service and reliability, and should give many years of service if a few service tips are observed. Clean outside of hand piece with alcohol after each use. Do not use dish washer or autoclave to clean or sterilize. Clean threads, lens cap and LED head with cotton ear swab tipped with light silicone lubricant once a month. Do not place hard plastic case near open flame or other heat source.

15. You use an autoclave or dishwasher to clean and sterilize the Quantum Quasar.

True

False